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ABSTRACT

The 1992 Tennessee Education Improvement Act resulted from a successful law suit by smaller and poorer school systems in Tennessee concerning equity of funding. The Act established the Basic Education Program (BEP), which increased the state sales tax rate, shifted state funds from better funded to poorer school systems, and required systematic student testing to improve accountability. This paper examines the underlying assumption of the lawsuit and BEP that funding levels and pupil performance are positively associated. Tennessee has 138 school districts, including 93 county school districts, 31 city or municipal districts, and 14 special districts. In 1995-96, the mean expenditure per pupil was $4,612 statewide and ranged from $3,558 to $6,991. Per pupil expenditures and teacher salaries were higher in city districts than in county districts. Correlation coefficients were obtained between two measures of expenditures (mean expenditure per pupil and mean teacher salary) and five measures of student achievement. Although levels of student performance varied greatly among school districts, there was no significant relationship between expenditures per pupil and pupil achievement when teacher salaries were controlled. Mean teacher salary had low positive relationships with pupil performance but explained less than 15 percent of variance of performance. The 21 school districts that exceeded state and national means for achievement included all types of districts, including 6 small rural county districts. Unknown variables account for most of the performance differences. (SV)

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IS THE LEVEL OF STUDENT ACADEMIC PERFORMANCE IN TENNESSEE PUBLIC SCHOOL SYSTEMS RELATED TO LEVEL OF EXPENDITURES FOR SCHOOL SYSTEMS*

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Introduction

The 1992 Tennessee Education Improvement Act was passed as a result of a successful law suit from smaller and poorer school systems in Tennessee on equity of funding. The Tennessee Supreme Court found the public school system in Tennessee was unconstitutional due to widely different levels of funding for various public school systems in Tennessee and ordered the state to correct the situation. The 1992 Act established the Basic Education Program (BEP) that contained several provisions including: 1) the enactment of a one-half cent increase in the state sales tax rate; 2) a shift in state funds from better funded to poorer school systems; and 3) a requirement of comprehensive and systematic student academic testing so that improved accountability of Tennessee public school systems could be established. Clearly an underlying theoretical assumption of the law suit and BEP was that funding level and pupil performance level are positively associated. This assumption is the basis for this study.

Research on the relationship between per pupil expenditures and achievement scores of pupils is limited and inconsistent. Galbraith (1992) in a comprehensive review of rural education in the United States concluded there is a positive relationship between resource level of schools and academic performance of students. He states: "In many of the poorest rural areas of the

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country, academic performance of students falls below the national average. Altering this situation is difficult because the amount of money available for education is often one determinant of educational program quality" (p. 54). However, Doud (1989), Muse and Thomas (1989), and Barker, Muse and Smith (1984-1985) found that students in small rural places with low resources perform well on national achievement tests. While achievement levels of pupils have been studied extensively by educators and school financing has been analyzed (Hanushah [1998], Augenblick and Nachtigal [1985], Bass [1988], Council for Educational Development and Research [1988] and Walberg and Fowler [1988]), systematic research on the relationship between these two variables has been lacking. Substantial discussion on "equity" of funding (Pisus, 1998) has occurred. But the underlying assumption of varying funding is a positive relationship to outcome of education involved in the discussion of equity funding.

The Tennessee Department of Education collects extensive data on student academic assessment scores for all pupils in public schools and also collects systemic revenue data by school system. In this study, these data are analyzed to determine the relationship between per pupil expenditures and pupil academic achievement scores for public school systems in Tennessee.[1] Academic achievement performance is determined as part of the Tennessee Comprehensive Assessment Program (TCAP) as specified in the 1992 Tennessee Education Improvement Act.

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[1]Data reported by the Department of Education by school system are for revenue provided to a school system and not expenditures *per se*. School systems may add or use revenue from a "fund balance" in any particular year. However, because any difference would be small, one percent more or less, revenues obtained are also viewed as expenditures in this study.

In the 1995-1996 year, the total public expenditure (state, local and federal) for all Tennessee public school systems was $4.0 billion or a mean expenditure of $4,612 per pupil. The per pupil expenditure ranged from a low of $3,558 in one county school system to a high of $6,991 in a city school system. Educational funding constitutes major expenditures for both state and county governments and for some city governments in Tennessee. The research question is whether differential funding levels make an impact upon educational performance of pupils? The implied hypothesis is that the greater the expenditures for education, the greater the achievement of students in academic performance and vice versa.

School Revenue

Expenditures per pupil varied widely prior to the establishment of the BEP for Tennessee public school systems. However, revenues still vary because of a number of factors. Funding for county and city school systems comes from state, county and federal sources. A major difference is that cities in Tennessee that operate school systems frequently add substantial revenue to the school system above those obtained from these three sources. Further, city revenue and federal revenue essentially bear no relationship to the levels of state and county revenue. While there is some relationship between state and county funding levels established in the BEP, it does not result in full equity. This relationship is discussed below.

State funding to Tennessee school systems is currently based upon: 1) number of pupils (Average Daily Membership or ADM); 2) level of county "fiscal capacity" as determined by a formula[2]; 3) the student body composition or BEP formula on many factors[3]; and 4) a "cost differential factor" for a few school systems with high community labor costs. This article does not argue whether these factors are properly computed for any school system, but only that they result in varying levels of state revenue to Tennessee public school systems. As indicated above, neither federal funding nor city funding are considered by the State of Tennessee in determining state level funding or "fiscal capacity."

State law addresses county level funding to public school systems to some extent, but counties can still adopt varying funding levels to a major extent. State law requires that one-half of the county-wide local option sales tax go to fund public education; and if there is a city school system in the county, the revenues must be prorated to the number of pupils (ADMs) in each system. County funding via county-wide property tax is set by the county legislative body (county commission). County-wide property tax revenues approved by the county commission for education must also be prorated between the county and city school systems based upon number of pupils (ADM). County revenues, once determined, are administered by the county or city school board and school administration. State law prohibits a reduction in "county effort" of

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[2]The author disagrees with the state formula used for measuring "fiscal capacity." The state uses a "regression analysis" of five independent variables to assess "fiscal capacity" as the dependent variable. Use of this procedure results in imprecise measurement of fiscal capacity according to the author. The author has communicated with state officers that regression analysis cannot properly be used to determine an unknown variable such as the dependent variable of "fiscal capacity."

[3]Several factors such as number of pupils by grade level and number of pupils with various "special educational needs" are included in this comprehensive formula used by the Tennessee Department of Education.

funding education, so that improved state funding is not allowed to be used to replace local funding.

Municipal or city governments often add revenue to their school system above state and county funding. In fact, city funding to city school systems adds greatly to funding equity differences of Tennessee public school systems. State funding to a city school system is based upon the county fiscal capacity and not upon any additional fiscal capacity of the city, because Tennessee cities are not required to provide any school revenue above state and county funding. In the 1995-1996 fiscal year, Tennessee cities with school systems added a mean of $742 per pupil above county school systems or about $13,00-$14,000 more per classroom than the county system.[4] Several Tennessee cities, especially cities in urban counties (counties with 8,000 to 25,000 total pupils), added substantial amounts of revenue above the level provided by the respective county in which they are located. In fact, the top seven funded per pupil school systems in Tennessee are city systems in urban counties. The mean level of revenue in these seven city school systems was $1,600 per pupil or about $28,000 more per classroom above the respective county system. This extra funding represented a one-third increase in mean level of funding per pupil. Teacher salaries averaged $5,150 higher in these seven city school systems compared to the respective county systems. Interestingly, the higher mean teacher salary, plus fringe benefits, while substantial, accounts for only one-fourth of the additional revenue for these top seven funded city school systems.

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[4]All means (averages) are unweighted by size (number of pupils or ADM) unless specified in this report as weighted means (ADM).

Data for this study were obtained for the 1995-1996 fiscal year from the *21st Century Report Card* published by the Tennessee Department of Education. Data on mean teacher salary and student academic assessment scores for all school systems were also obtained from this report. Total operating school expenditures was determined by adding state, federal and local revenue for each Tennessee public school system. This total amount of revenues was divided by the number of pupils (ADMs) in each school system. Capital expenditures that vary widely from year to year were not included in this analysis.

Student Academic Assessment

A fundamental goal of the BEP, as indicated earlier, was to increase academic accountability of school systems, especially as reflected by the performance of students on comprehensive examinations. These examinations are part of the Tennessee Comprehensive Assessment Program (TCAP). Accountability under this program is involved at the teacher, school, grade and system levels. Assessments are made on 1) actual test scores and 2) the gains or "value added" test scores from one point in time to another. In this study five measures of pupil academic performance at the system level for the 1995-1996 academic year were used. These were: 1) the mean eighth grade assessment test score on five subject areas (reading, social studies, science, mathematics and language); 2) the mean level of gain or "value added" score on these five subjects between the third and eighth grade level; 3) the mean high school test score for three mathematics subjects (algebra I, algebra II and geometry); 4) the mean gain or "value added" score on these three mathematics subjects; and 5) the mean ACT score for high school students. Requirements for high school assessment scores in other subjects have not been fully implemented by the Tennessee Department of Education.

School Systems

There are 138 public school systems in Tennessee. These are composed of 93 county school systems, 31 city or municipal school systems, and 14 special school districts.[5] The special school systems pose somewhat of a problem. There are five special school districts each in Carroll County and Gibson County; these two counties have no county or city school systems. The data for the special school districts in each of these two counties were grouped together in this study and considered as county school systems. The other four special school districts are located in four different counties. Each of these four counties have a county school system and no city school system; each special school district is located in the county seat town. These four districts were treated as city school systems in this study; these were Franklin SSD (Williamson County), Lebanon SSD (Wilson County), Oneida SSD (Scott County) and Paris SSD (Henry County). This resulted in having data on 95 county school systems and 35 municipal school systems.

Analysis of data on the relationship between expenditures per pupil and student academic performance was conducted for 1) the 95 county school systems and 2) for all 130 school systems. Complete data were available for all 95 county school systems, but for only 17 of the 35 city school systems. Fourteen city school systems had no reported data on student assessment at the high school level because they did not operate a high school. Another four city systems had no reported data on some high school assessments items. The city systems that did not have

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[5]Special school districts are created by state law and are labeled as "special school districts" because they do not exactly fit either a county or a city system. Placement of these 14 systems into the county and city systems was felt to be a better option from either excluding them or treating them as a distinct and separate category. Another problem is that some city or municipal school systems do not have high schools, as well as some special school systems considered as city systems in this study.

reported high school data were generally the smaller city school systems. Further, the larger city systems with complete assessment data had substantially higher expenditures per pupil and higher teacher salaries than did either county school systems or smaller city systems.[6]

Differences occur between county and city school systems on several expenditure factors. The mean per pupil revenue for the 95 county systems was $4,330. On the other hand, the 17 city systems with complete student assessment data had mean per pupil revenue of $5,519 or $1,189 higher than county systems. The 18 city school systems with incomplete student assessment data had a mean of $4,651 per pupil revenue. Teacher salaries also varied by type of system. The mean teacher salary for the 95 county systems was $29,875 compared to $35,900 for the 17 city school systems with complete assessment data and $31,795 for the 18 city systems without assessment data at the high school level.

Student assessment scores were slightly higher for the city school system compared to the county school systems on an unweighted (ADM) basis, but slightly lower on a weighted (ADM) basis. The primary factor in the difference on a weighted and unweighted means basis for city school systems was that the larger city school systems (ADM) had relatively poor student assessment scores. A comparison between city and county school systems is also made difficult because high school assessment scores were available for only one-half of the city systems.

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[6]No separate analysis was reported for the relationship between expenditures and achievement because of the relatively few city systems with complete data reported and the selectivity of those with data reported. Further, when data from the city systems are included with county systems there is some potential for systematic bias in the analysis of all school systems.

Correlation of Revenue and Assessment

The major objective of this study was to determine the relationship between mean student assessment scores and expenditures per pupil (ADM). The premise is that greater revenues or lessor revenues should be associated with education outcomes for pupils in terms of learning. Correlation coefficients (r^2) were obtained between two measures of expenditures, 1) mean expenditure per pupil and 2) mean teacher salary and five assessment measurements of pupil performance. The results for the 95 county systems are presented in Table 1.

Table 1. Correlation Coefficients (r^2) Between Five Measures of Pupil Academic Assessment and Expenditures Per Pupil and Teacher Salary for Tennessee 95 County School Systems, 1995-1996

	Revenue Per Pupil		Teacher Salary
Assessment Measure	Simple (Zero Order) "r^2" Coefficient	Partial (First Order) "r^2" Coefficient[a]	Simple (Zero Order) "r^2" Coefficient
1) Third to eighth grade gain (five subjects)	-.02	-.02	.01
2) Eighth grade score (five subjects)	-.00	-.02	.16*
3) High school mathematic gain (three subjects)	.00	-.01	.06*
4) High school mathematic score (three subjects)	-.00	-.01	.09*
5) High school ACT score	-.01	-.05*	.17*

*The coefficient was statistically significant at the .05 level of probability.
[a]The statistical influence of mean teacher salary was removed or statistically controlled by taking a first order partial correlation coefficient.

Results of the correlation data shown in Table 1 for the 95 county systems indicate there is no evidence that any relationship exists between pupil performance or any of the five

assessment measurements and revenue per pupil. In fact, all five correlation coefficients (r^2) between academic performance and revenue per pupil were very close to zero. When the influence of teacher salary is removed or statistically controlled (first order partial coefficients), all r^2 coefficients were negative. Thus, the signs of these coefficients were opposite of what was expected. No explanation can be given why higher per pupil expenditures do not result in a positive impact on student achievement performance.

An internal inspection of the data by category of school based upon level of expenditures also support the conclusion of no positive impact of higher expenditures. The 95 county systems were placed into five categories (19 school systems each) ranked from highest expenditures per pupil to lowest. A somewhat interesting finding was that the highest one-fifth funded Tennessee county school systems, in fact, had the lowest mean level of academic performance, while the next to the lowest funded one-fifth of the county school systems had the highest mean academic performance. All differences were small, however. Another interesting finding was that while expenditures per pupil ranged from a mean of $5,000 per pupil for the highest one-fifth county school systems to $3,840 for the lowest one-fifth, mean teacher salary was very similar in all five categories of county school systems. This observation is also reflected by the low r^2 coefficient (.07) between expenditures per pupil and mean teacher salary for the 95 county school systems. This low correlation is somewhat surprising given the fact that salaries for teachers compose a large proportion (about 60 percent) of school budgets.

Analysis of the relationship between pupil performance mean teacher salary produced a somewhat different result from total expenditures. Mean teacher salary in the 95 Tennessee county school systems produced low positive correlation r^2 coefficients with the five measures of

student academic performance. Four of these coefficients were statistically significant. However, the amount of variance explained by mean teacher salary was low and ranged from 1 percent for third to eighth grade gain to 16 percent for eighth grade score and 17 percent for ACT score. Thus, over 80 percent of student academic performance at the system level on any of the assessment measures is left unexplained. There are examples where high mean assessment scores are found in school systems with high teacher salaries and also in systems with low teacher salaries.

City Systems

City school systems in Tennessee have a fourth source of potential revenue that county school systems do not have. City revenues are not required by law, but show a willingness of city leaders to aid funding for education. However, the data are not very consistent on whether this extra funding pays a dividend in improved pupil academic performance. Correlation coefficients for only the city systems shows some small positive influence of funding with pupil assessment, but no correlation coefficient was statistically significant. The number of city systems is also low.

A second way of viewing the impact of city funding is a direct comparison of city school systems with the respective county system. Such a comparison shows a few instances where a city school system has both greater expenditures and greater assessment scores than the respective county system. Greeneville, Oak Ridge, Elizabethton and Oneida SSD fit this category. On the other hand, both Memphis and Chattanooga school systems with higher

expenditures have substantially lower assessment scores than the respective county system.[7] Further, several city school systems that have good academic performance and substantially higher expenditures than the respective county system are in counties that also have good academic performance of pupils such as Johnson City, Kingsport, Bristol, Alcoa, Maryville, Tullahoma and Manchester school systems. The data reported on grade school level performance for all 35 city school systems show very little difference in academic performance with the respective county system. Because many city systems do not have high schools or have incomplete data reported on high school pupil performance, a direct comparison was limited for one-half of the city systems with the respective county system on all five assessment measures. Thus, a conclusion that greater funding within a locale, such as a county, often does not result in greater assessment scores.

All Systems

Correlation coefficients between academic performance and revenue per pupil for all 130 Tennessee public school systems are low positive coefficients and statistically significant in four cases.[8] However, when mean teacher salary is statistically controlled, all r^2 coefficients are negative and very close to zero (Table 2).

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[7]The Chattanooga and Hamilton County school systems were merged in the 1997-1998 school year.

[8]The relationships between expenditures per pupil and high school assessment may be spurious because the 17 city school systems with complete academic data generally have higher expenditures, teacher salaries, and academic performance than other city systems without high school assessment scores. These city systems with complete assessment data are often in counties that have good academic pupil performance. Thus, adding the data for selective city school systems to all county systems may produce relationships that are somewhat spurious for all Tennessee school systems.

Table 2. Correlation Coefficients Between Five Measures of Pupil Academic Assessment and Expenditures Per Pupil and Teacher Salary for Tennessee 130 County School Systems, 1995-1996[a]

	Revenue Per Pupil		Teacher Salary
Assessment Measure	Simple (Zero Order) "r^2" Coefficient	Partial (First Order) "r^2" Coefficient	Simple (Zero Order) "r^2" Coefficient
1) Third to eighth grade gain (five subjects)	-.00	-.01	.00
2) Eighth grade score (five subjects)	.05*	-.00	.13*
3) High school mathematic gain (three subjects) N-115	.04*	-.00	.11*
4) High school mathematic score (three subjects) N-116	.07*	-.00	.17*
5) High school ACT score N-112	.10*	-.00	.26*

*The coefficient was statistically significant at the .05 level of probability.
[a]Because of no data for some city systems at the high school level, the number of observations was less than 130 for variables 3, 4 and 5.

Overall, the data shown in Table 2 indicates, in a similar fashion to analysis of just county systems, that the only positive and significant relationships are between mean teacher salary and mean pupil academic performance scores. In fact, no positive relationships exist between expenditures per pupil and pupil performance on the five measures for all school systems when teacher salary is statistically controlled. On the other hand, there was a low positive impact of teacher salary on pupil academic performances for four of the five assessment measures. However, the amount of variance of pupil assessment explained by mean teacher salary ranged from 11 percent for high school mathematics score to 26 percent for high school ACT score.

Top School Systems

Another way to look at Tennessee school systems is to find those systems that perform well at all levels. A look at top Tennessee public school systems in academic performance of students reveals that they are in all locations of the state and in all categories of school systems. Data in Table 3 show the 21 school systems that equaled or exceeded either the state or national level of performance on each of the five measures of academic performance analyzed. While arguments may be made as to whether 1) actual level of academic assessment scores or 2) amount of "value added" assessment is the best measure of academic performance, the ability of a school system to demonstrate high performance on both aspects is indicative of a "good" school system. Also, a school system that can show high performance at both lower and upper grade levels is indicative of a "good" comprehensive good system. The statistical data show that school systems that perform well in one academic area tend to score well in other areas. All correlation coefficients between the five measures of academic performance with one another were positive and most coefficients were statistically significant. These coefficients indicate there is a "school system effect" on academic performance that goes beyond a school building or grade level.

The 21 school systems that met or exceeded all five measures of performance at the state or national mean level of performance were found in several classifications of Tennessee school systems (Table 3). These included three metropolitan county school systems (Hamilton, Knox, and Shelby), six urban county systems (Blount, Coffee, Montgomery, Putnam, Sumner, and Williamson), six city systems in urban counties (Alcoa, Dyersburg, Elizabethton, Maryville, Oak Ridge, and Tullahoma) and six rural county systems (Chester, Humphreys, Lawrence, Rhea, Warren, and Weakley). Expenditure per pupil was not seemingly a factor for these 21 school

systems. The weighted mean expenditure per pupil (based on ADM) of these 21 school systems was $4,363 per pupil. This level of expenditure was $249 lower than the weighted (ADM) mean expenditure per pupil for all Tennessee school system of 875,675 pupils in 1995-1996 which was $4,612 per pupil. The weighted teacher salary was $33,564 for these 21 school systems or $438 higher compared to the weighted mean salary for all Tennessee public school systems of $33,126.

There were another 21 Tennessee school systems that met the level of academic performance on four of the five pupil assessment measures. On the other hand, there were six school systems that did not meet the level of performance on any of the five assessment measures and 19 school systems that performed at this level on only one of the five measures. The mean weighted per pupil expenditure for these latter 25 school systems that met one or none of the standards was very similar to the mean of the 21 school systems that met the standard in all five measures.

Summary and Conclusions

The Tennessee Education Improvement Act or Basic Educational Program (BEP) was passed in 1992 in response to a law suit claiming inadequate funding for smaller and poorer Tennessee school systems. The BEP raised the level of state funding, shifted the allocation of state funding and included accountability for pupil performance for all Tennessee public school systems. The level of funding continued to vary greatly among Tennessee school systems in 1995-1996, especially due to additional city revenue. Also, level of academic performance of pupils by Tennessee school systems varied greatly by school system as reflected by both actual test scores and amount of "value added" assessment. However, an analysis of the relationship

between expenditures per pupil (total of state, federal, county and city sources) and pupil performance on five measures of assessment for the 130 Tennessee public school systems studied revealed no significant relationship with pupil academic assessment when level teacher salary was statistically controlled. Level of mean teacher salary by school system showed low positive relationships with pupil academic assessment, but explained less than 15 percent of the variance of pupil academic assessment of the five measures studied. Expenditures for items other than teacher salary, on the other hand, explained none of the pupil academic assessment differences.

City school systems in Tennessee often add substantial additional revenue beyond the shared county revenue. While there was substantial additional funding and higher teacher salaries for teachers in many Tennessee city school systems, academic performance was not greater than the respective county system for the majority of these city systems. Some city systems performed better, some poorer, but in most cases the differences were small. Somewhat surprising was that only about one-fourth of the added city revenues of the well-funded city school system beyond the respective county system go to higher teacher salaries. A similar situation exists for county school systems. For example, the better funded county school systems provided very little of the additional revenues, that were above the level of the poorer funded county systems, for higher teacher salaries. Per pupil expenditures and mean teacher salary were correlated at a very low level with one another for county school systems, even though teacher salaries are a major part of school budgets.

There were 21 school systems that equaled or exceeded the state or national mean level in all five pupil academic assessment measures studied. These included county schools systems in

three metropolitan counties, six urban counties (8,000 to 25,000 total pupils in county) six small rural counties, and six city school systems in urban counties. All six of the "high" performing rural county schools systems had few pupils, low expenditures per pupil, and low teacher salaries compared to all school systems.

Revenue differences between Tennessee public school systems would not be expected to explain all of academic performance differences, but the failure of level of per pupil expenditures to explain any difference in pupil academic performance is surprising. Requests for additional school funding are often made on the basis that the funds are needed to "improve" the educational process. More teaching and nonteaching personnel, lower classroom size, more classroom equipment and supplies, more specialized programs, and improved teacher salaries are features often purported to improve quality of education. However, the combined total of expenditures, other than teacher salary, was not found to be associated with pupil academic performance for Tennessee public school systems. Good school systems exist with high levels of funding, but good school systems also exist with low levels of funding. The failure of expenditures for items other than for teacher salary to have an influence on student performance may indicate that how these expenditures are made need to be carefully reviewed.

A key research question is why do many school systems that obtain higher funding levels fail to translate these revenues into greater academic performance? A parallel question is why some poorly funded school systems perform very well academically?

Unknown variables account for most of the academic performance differences of Tennessee public school systems. These unknown factors could include the goals of a school system, leadership within the school system, student body characteristics, background factors

associated with the community, and "teacher effects." Thus, research on other factors and variables is needed to explain what accounts for the differences in school system academic performance.

There are undoubtedly individual "teacher effects" on academic performance. These teacher effects may occur for a total school system, but may not be associated with the funding level in a system. The fact there is a low relationship of academic performance and teacher salary at the system level may indicate an individual "teacher effect" that is substantially greater. This individual "teacher effect" could be "masked" by several factors in how teachers are selected, evaluated, retained and paid. For example, teachers are paid on salary schedules within a school system. Second, selection and retention procedures of teachers and school administrators may give little attention to improvement of student academic performance. Third, teachers may not move or migrate very rapidly for pay differences. The latter factor, in fact, allows school systems with poorer funding to retain "good" teachers.

Table 3. Tennessee Public School Systems that Equaled or Exceeded the Mean Level of Academic Performance of Pupils on Five Measures, 1995-1996[a]

School System	Number of Pupils (ADM)	Expenditures Per Pupil[b]	Mean Teacher Salary
		----------dollars----------	
I. County Systems:			
Metropolitan Counties			
Hamilton	23,388	4,544	36,785
Knox	52,277	4,521	32,975
Shelby	45,383	4,009	35,748
Urban Counties			
Blount	10,080	4,308	35,195
Coffee	3,943	4,451	31,338
Montgomery	21,473	4,065	30,597
Putnam	9,048	4,154	30,776
Sumner	21,669	4,116	31,592
Williamson	15,715	4,522	34,682
Rural Counties			
Chester	2,347	4,021	28,746
Humphreys	2,997	4,150	29,590
Lawrence	6,783	3,915	29,732
Rhea	3,946	3,983	29,293
Warren	6,236	4,154	30,235
Weakley	5,136	4,005	28,959
II. City Systems:			
Urban Counties[c]			
Alcoa (Blount County)	1,458	6,072	41,355
Dyersburg (Dyer County)	3,316	4,800	36,396
Elizabethton (Carter County)	2,215	5,112	33,152
Maryville (Blount County)	3,894	5,256	36,650
Oak Ridge (Anderson County)	4,849	6,698	41,453
Tullahoma (Coffee County)	3,430	5,377	34,508
Unweighted Mean	11,885	4,583	33,322
Weighted Mean[d]	---	4,363	33,564
State - Unweighted Mean	6,736	4,530	30,929
State - Weighted Mean	---	4,612	33,126

[a]The mean level of performance was higher in Tennessee than the United States for both eighth grade assessment score, 58 percentile versus 50 percentile, and high school mathematics gains, 56 percentile versus 50 percentile. On the other hand, the mean third to eighth grade gains were higher for the United States than for Tennessee, 100 percent of normative level versus 97 percent. Also, the mean high school mathematic score was higher in the United States, 50 percentile versus 49 percentile, and for the mean ACT score, 20.9 versus 19.9. The 21 public schools listed met or exceeded the lower of each of these five assessment level areas.

[b]Expenditures per pupil for 1995-1996 were determined by adding all revenue from county, state, federal and city sources and dividing this total by number of pupils (ADM) in 1995-1996.

[c]Urban counties are those with 8,000 to 25,000 pupils (ADM) in the county and/or city systems in the county. Metropolitan counties have over 25,000 pupils and rural counties under 8,000 pupils.

[d]The weighted mean was based upon number of pupils (ADM).

References

Augenblick, J., and P. Nachtigal (1985). *Equity in rural school finance.* (Paper presented at the National Rural Education Forum.) Las Cruces, NM: ERIC Clearinghouse for Rural Education and Small Schools. This paper reviews equity issues from the perspective of rural schools, examines strategies used by states to equalize funding, and recommends the development of a comprehensive database on rural school finance.

Barker, B. O., I. D. Muse and R. B. Smith (1984-1985). A status report of rural school districts in the United States under 300 students. *The Rural Educator, 6,* (1), 1-4.

Bass, G. R. (1988). Financing for small schools: A study. *Rural Educator*, 9(2), 9-14.

Council for Educational Development and Research (1988). *End of the road: Rural America's poor students and poor schools.* (National Rural, Small Schools Task Force Report to the Regional Educational Laboratories.) Washington, DC: Author. A mix of two reports: 1) work by NWREL in using common core data and state data to identify rural schools beset by limited resources and students from poor families and 2) review of regional laboratory work during the first year of the rural initiatives.

Doud, J. L. (1989). *The K-8 principal in 1988: A ten-year study.* Alexandria: National Association of Elementary School Principals.

Galbraith, M. W. (Ed.) (1992). *Education in the Rural American Community.* Malabar, Florida: Krieger Publishing Company.

Muse, I. D., and G. J. Thomas (1989). *The rural elementary school principal: A seven-state study.* Unpublished manuscript, Brigham Young University, Department of Educational Leadership, Provo, UT.

Picus, L. O. (1998). *Rethinking equity —There are alternatives.* School Business Affairs, April, 3-8.

Walberg, H., and W. Fowler (1988). Expenditure and size efficiencies of public school districts. *The Heartland Institute: A Heartland Policy Study*, 22, 1-22.